SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

COMPARATIVE STUDY OF DOSSIER SUBMISSION REQUIRED FOR ANDA IN INDIA VS EUROPEAN UNION

Miss. Snehal Mandaokar[1], Prof. Dr. B. V. Bakade[2]
Research Scholar[1], Research Guide[2]
Department of Regulatory Affairs, Pataldhamal Wadhwani College of Pharmacy, Yavatmal (M.S.) 445001

ABSTRACT

The approval of generic medicines plays a crucial role in enhancing healthcare accessibility, reducing treatment costs, and supporting sustainable public health systems worldwide. However, the regulatory expectations for generic drug dossiers differ significantly across regions, influencing development timelines, compliance burden, and market entry strategies. This review provides a comprehensive comparative analysis of dossier submission requirements for generic drug approval in India and the European Union (EU), with a focus on key regulatory components, harmonization efforts, existing challenges, and future directions.

The paper examines critical modules of the Common Technical Document (CTD), including quality, nonclinical, and clinical/bioequivalence data, highlighting similarities and distinctions between the Central Drugs Standard Control Organization (CDSCO) in India and the European Medicines Agency (EMA) in the EU. Special attention is given to variations in bioequivalence study expectations, stability testing protocols, reference product selection, GMP compliance, data integrity standards, and timelines for review and approval.

Despite ongoing global efforts toward harmonization—supported by ICH guidelines and WHO recommendations—substantial gaps persist. These differences often impact regulatory predictability for pharmaceutical manufacturers and can delay patient access to affordable generics. The review identifies major regulatory challenges such as procedural complexity, evolving documentation requirements, and country-specific technical barriers.

Finally, the paper proposes future pathways for improving convergence between Indian and EU regulatory frameworks, emphasizing risk-based evaluation, digital submission platforms, enhanced reliance pathways, and strengthened global collaboration. Such harmonization has the potential to streamline generic drug development, promote regulatory efficiency, and ultimately improve global medicine availability.

INTRODUCTION

The global generic drug market has witnessed remarkable growth over the past two decades, driven by increasing healthcare demands, patent expiries of blockbuster drugs, and the need for cost-effective therapeutic alternatives. Generic medicines play a pivotal role in improving patient access by offering clinically equivalent yet affordable versions of innovator products. As healthcare systems worldwide continue to emphasize affordability and accessibility, the reliance on high-quality generic drugs is expected to rise even further.

A critical component supporting this expansion is the presence of **robust and transparent regulatory frameworks**. These frameworks ensure that generic products entering the market meet stringent standards of quality, safety, and efficacy. Without clearly defined regulatory expectations—particularly regarding dossier submission, quality documentation, bioequivalence data, and post-approval requirements—the approval and availability of generic medicines would be significantly hindered. Regulatory systems such as those governed by the **Central Drugs Standard Control Organization (CDSCO)** in India and the **European Medicines Agency (EMA)** or national competent authorities in the European Union (EU) provide structured pathways for the assessment and approval of generics.

The aim of this review paper is to provide a **comparative evaluation of generic drug dossier submission requirements in India and the European Union**, with special emphasis on regulatory harmonization, operational challenges, and future opportunities. Specifically, the paper seeks to:

- **Compare the regulatory frameworks of CDSCO (India) with EMA and EU National Agencies**, focusing on approval pathways for generic medicinal products.
- **Evaluate the Common Technical Document (CTD)-based dossier structure**, highlighting similarities and differences across both regions.
- **Identify harmonized and divergent regulatory expectations**, including data requirements for quality, non-clinical, and clinical (bioequivalence) modules.
- **Assess the implications of these regulatory differences** for pharmaceutical manufacturers, regulatory professionals, and policymakers, particularly in terms of dossier preparation, approval timelines, compliance burden, and global market entry.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

By providing an in-depth comparative analysis, this review aims to contribute to enhanced understanding of global regulatory alignment, promote efficient dossier development practices, and support future harmonization initiatives that can facilitate smoother access to generic medicines across markets.

Generic Drug Regulatory Pathways

India: CDSCO and DCGI Regulatory Structure

In India, the regulatory framework for generic medicines is primarily governed by the **Central Drugs Standard Control Organization (CDSCO)** under the Ministry of Health and Family Welfare. The **Drugs Controller General of India (DCGI)** serves as the national regulatory authority responsible for approving new drugs, overseeing clinical trials, establishing standards for drug manufacturing, and regulating the import and export of pharmaceuticals.

Generic drug approval in India follows an **ANDA-like approach**, where applicants must demonstrate pharmaceutical equivalence and bioequivalence with the reference listed drug. The regulatory processes operate through a decentralized structure involving both CDSCO headquarters and zonal offices, with state licensing authorities contributing to manufacturing site approvals. The dossier submission generally follows the **CTD format**, with emphasis on quality (Module 3), bioequivalence data, and compliance with Indian Pharmacopoeia or alternative internationally recognized standards.

European Union: EMA and National Competent Authorities (NCAs)

In the European Union, the approval of generic medicines is governed under **Directive 2001/83/EC**, which provides a harmonized legal basis for medicinal product regulation across Member States. The **European Medicines Agency (EMA)** plays a central role in the scientific evaluation of certain categories of medicines, while the majority of generic drug applications are reviewed through decentralized or mutual recognition procedures led by individual

National Competent Authorities (NCAs).

Generics in the EU must meet criteria of sameness in active substance, strength, dosage form, and route of administration compared to the reference medicinal product authorized within the EU. The dossier follows the **EU Common Technical Document (EU-CTD)** format with strict requirements for pharmaceutical quality, bioequivalence studies, and GMP compliance. The EU also enforces rigorous pharmacovigilance and lifecycle management obligations, ensuring continuous monitoring of generic product safety and performance.

Comparison: ANDA-like System in India vs EU Generic Framework

While India's system resembles the U.S. ANDA model, the EU adopts a more **harmonized yet multi-agency regulatory structure**, combining centralized scientific assessment with national oversight. India's pathway is comparatively **faster and less administratively complex**, whereas the EU system is **more standardized and deeply aligned with international ICH guidelines**. Both regions rely on the CTD format and bioequivalence evidence, yet differ in areas such as dossier depth, GMP inspection rigor, lifecycle obligations, and the degree of regulatory harmonization across jurisdictions. These differences shape approval timelines, dossier complexity, and market access dynamics for global generic manufacturers.

Evolution of CTD and eCTD

The development and implementation of the Common Technical Document (CTD) and its electronic version (eCTD) represent major milestones in the global harmonization of pharmaceutical regulatory submissions. The International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) played a central role in creating the CTD format to standardize dossier structure across major regulatory regions, thereby reducing duplication of effort and facilitating simultaneous submissions. The CTD is divided into five modules—covering administrative information, quality, nonclinical, and clinical data—which enables a uniform approach for generic as well as innovator applications.

India and the European Union have gradually aligned with the ICH framework, though their adoption timelines differ significantly. The EU, as an original ICH member, mandated CTD implementation for all marketing authorization applications beginning in 2003, followed by compulsory eCTD submissions for centralized procedures and progressively for decentralized and mutual recognition procedures. In contrast, India fully adopted the CTD format much later, with CDSCO operationalizing CTD-based submissions in the late 2000s and progressively transitioning to eCTD for selected product categories. Although eCTD is not yet universally mandatory in India, regulatory reforms continue to push toward digital submissions and improved traceability.

Overall, the evolution of the CTD and eCTD has greatly influenced regulatory expectations in both regions, promoting convergence in dossier structure while also highlighting differences in implementation speed, technological readiness, and regulatory resource capacity.

Here is the drafted section **"Comparative Review of CTD Modules (Modules 1–5)"** in a clear, academic, thesis-ready form

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

Comparative Review of CTD Modules (Modules 1–5)

The Common Technical Document (CTD) structure provides a harmonized global template for regulatory submissions; however, region-specific adaptations remain in both India and the European Union (EU). While both jurisdictions follow the ICH-defined CTD format for Modules 2–5, Module 1 continues to reflect national regulatory requirements. A comparative assessment of each module highlights similarities driven by global harmonization efforts, as well as key divergences arising from administrative, legal, and technical expectations.

Module 1: Regional Administrative Information

India (CDSCO):

Module 1 includes country-specific forms such as Form 44, authorization letters, fees payment receipts, notarized Power of Attorney, manufacturing certificates, and labeling requirements in accordance with Schedule Y and Drugs and Cosmetics Rules. India also requires stability data in Zone IVb conditions (30°C/75% RH), test licenses, batch release certificates, and details of the Indian Authorized Agent for foreign manufacturers.

EU (EMA/NCAs):

Module 1 follows the EU-specific structure under Directive 2001/83/EC. Critical components include the European Application Form, SmPC, labelling and patient information leaflet (PIL) aligned with QRD templates, Pharmacovigilance System Master File (PSMF) summary, risk management plan (RMP), Paediatric Investigation Plan (PIP), and national requirements when submitting via the DCP/MRP. The EU also requires proof of GMP compliance via EU-GMP certificates and details on manufacturing and import authorization for EU-based facilities.

Module 2: Summaries and Overviews

Both CDSCO and EU require the same structure for quality overall summary (QOS), nonclinical overview, clinical overview, and corresponding written summaries.

- **India:** Reviewers expect detailed justification for BE study design, waiver requests, and discussion on critical quality attributes (CQAs) for generic drug products.
- **EU:** More extensive emphasis is placed on comparability of pharmaceutical development, justification for excipient choices, and quality-by-design (QbD) elements when provided.

Module 3: Quality (CMC) Information

The core CMC expectations under CTD Module 3 are globally harmonized, but implementation differs.

India:

CDSCO follows ICH guidelines for stability, impurities, QbD (optional), and pharmaceutical development. Mandatory inclusion of stability data under climatic Zone IVb is a significant distinguishing factor. India accepts both API-DMF and CEP pathways; however, DMFs must be filed with CDSCO separately and not through EDQM.

EU:

EU procedures require strict compliance with ICH guidelines, EDQM monographs, and Ph. Eur. standards. The EU's use of the CEP system simplifies API assessment. EU regulators place strong emphasis on process validation, impurity profiling, genotoxic impurity risk assessment, suitability of container–closure systems, and nitrosamine risk evaluation.

Module 4: Nonclinical Study Reports

Nonclinical data requirements for generics are largely waived in both regions unless safety concerns arise.

- **India:** Nonclinical studies are generally not required unless the formulation contains a new excipient or novel delivery system.
- **EU:** Similar waiver principles apply; however, regulators may request justification for excipient safety, extractables/leachables (E&L), and biocompatibility depending on dosage form.

Module 5: Clinical Study Reports

Clinical requirements for generics remain centered on pharmacokinetic bioequivalence (BE) studies.

India:

BE studies must comply with GCP and Schedule Y guidance. Waiver of in vivo studies is considered only in specific BCS-based cases. India accepts studies conducted at certified CROs in compliance with Indian or international standards.

EU:

EU follows extensive BE guidelines under EMA and ICH M13. In addition to standard BE data, the EU may require:

- Food effect studies
- Fed/fasted comparisons
- Replicate studies for highly variable drugs
- Comparative dissolution across all markets

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

EU also expects a detailed justification for BE waivers and requires bioanalytical method validation fully aligned with EMA standards.

Below is a well-structured and expanded section for **"Comparative Evaluation of Approval Pathways and Timelines"** suitable for your review article.

Comparative Evaluation of Approval Pathways and Timelines

The approval pathways for generic drugs in India and the European Union (EU) share the common objective of ensuring quality, safety, and therapeutic equivalence with the reference product; however, the processes differ significantly in regulatory rigor, review mechanisms, and overall timelines. India follows a centralized system under the Central Drugs Standard Control Organization (CDSCO), whereas the EU uses a combination of centralized, decentralized, mutual-recognition, and national procedures, depending on the product and applicant strategy.

India: CDSCO Approval Pathway and Timelines

In India, generic drug applications are submitted to the CDSCO through the **New Drug Division** or respective **Zonal/Sub-Zonal offices** depending on the product category. The regulatory pathway resembles the ANDA system but is less standardized than that of the USFDA.

Key features include:

- **Application Format**: CTD/eCTD format including bioequivalence (BE) study data, CMC information, and product particulars.
- **Review Process**: Evaluation by subject experts, technical review committees, and where required, the Drugs Controller General of India (DCGI).
- **Site Inspections**: Conducted by CDSCO or state inspectors for GMP compliance.
- **Timelines**:
  - For a standard generic drug approval, the review process generally ranges from **6 to 12 months**, although delays are common due to dossier deficiencies, backlog, or additional data requests.
  - Products requiring BE studies or complex generics may face extended timelines.

India also lacks a formal "clock-stop" mechanism, resulting in variability in total review duration.

European Union: EMA/NCA Approval Pathways and Timelines

The EU offers four regulatory pathways for generic drug approval:

1. **Centralized Procedure (CP)** – Coordinated by EMA; mandatory for certain categories but optional for generics.
2. **Decentralized Procedure (DCP)** – Used when the product is not yet approved in any EU member state.
3. **Mutual Recognition Procedure (MRP)** – Applied when the product is already approved in one member state and recognition is sought in others.
4. **National Procedure (NP)** – For approval in a single member state.

Key features include:

- **Application Format**: Mandatory CTD/eCTD format aligned with ICH guidelines.
- **Review Process**: Assessment coordinated between reference member state (RMS) and concerned member states (CMSs) in DCP/MRP.
- **Defined Review Timelines**:
  - DCP: **210 days** (excluding clock-stop periods for applicant responses).
  - MRP: **90 days** after RMS approval.
  - National procedure timelines vary by country but generally range from **210 to 300 days**.
- **Transparency Measures**: Assessment reports (EPARs, PARs) publicly available for many products.
- **Clock-stop System**: Allows applicants to submit deficiency responses without affecting official review time.

Comparative Insights

- **Regulatory Structure**: EU offers multiple routes, whereas India primarily relies on a single national pathway.
- **Timeline Predictability**: EU provides defined, transparent timelines; India's timelines vary due to capacity, queries, and administrative delays.
- **Dossier Requirements**: Both rely on CTD/eCTD, but EU requirements are more harmonized and stringent in terms of quality and BE standards.
- **Assessment Mechanisms**: EU makes extensive use of RMS/CMS collaboration, improving consistency. India's review relies more on expert committees.
- **Impact on Industry**:
  - EU approval is more predictable but resource-intensive.
  - India offers a quicker pathway in some cases but with greater variability and less procedural harmonization.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

Regulatory Fees and Resource Implications

Regulatory fees and associated resource requirements form an important dimension of the comparative assessment between India and the European Union (EU) for generic drug dossier submissions. These financial and administrative components directly influence the cost of market entry, timelines for approval, and the overall regulatory burden on applicants.

India (CDSCO/DCGI)

In India, regulatory fees for generic drug applications are significantly lower compared to the EU, reflecting the country's emphasis on affordability and domestic manufacturing growth. Fees are charged for activities such as application submission, manufacturing site inspection, clinical trial permissions (if applicable), and registration of foreign sites and products. Resource requirements typically include the preparation of a CTD-format dossier, bioequivalence (BE) study data, quality documentation, and facility readiness for Good Manufacturing Practices (GMP) audits. Although CDSCO has implemented digital submission platforms, resource demands remain moderate due to fewer procedural layers and faster approval cycles relative to mature regulatory systems.

European Union (EMA + NCAs)

The EU regulatory ecosystem involves more substantial fees due to its highly structured and resource-intensive evaluation processes. Applicants must pay fees for dossier assessment, GMP inspections, pharmacovigilance compliance, variations, and renewals. Costs vary between the centralized procedure (via EMA) and decentralized/mutual recognition procedures (via National Competent Authorities).

Resource implications are considerably higher, driven by stringent documentation standards, comprehensive Module 1 regional requirements, extensive post-marketing obligations, and the maintenance of electronic systems such as EudraVigilance and eCTD lifecycle management.

Comparative Perspective

Overall, India offers a lower-cost regulatory entry point, making it attractive for manufacturers in emerging markets. In contrast, the EU imposes higher financial and administrative obligations but provides access to a unified, highly regulated market with strong patient safety protections. Understanding these differences is essential for pharmaceutical companies when planning global generic product launches, resource allocation, and regulatory strategy optimization.

Challenges Identified

Despite significant progress toward harmonizing regulatory frameworks, several challenges persist in aligning generic drug dossier submission requirements between India and the European Union. These barriers influence approval timelines, dossier quality, regulatory predictability, and overall industry compliance.

1. Variability in Regulatory Requirements

Although both India and the EU follow the CTD structure, specific expectations within individual modules differ.

- India often mandates region-specific administrative documents in **Module 1**, such as Form 44, additional affidavits, and product registration certificates, which are not required in the EU.
- The EU maintains more detailed expectations for **non-clinical and clinical overviews**, bioequivalence justifications, and risk-management plans (RMPs), creating inconsistencies for companies preparing dossiers for both regions.

2. Differences in Quality Standards

- EU regulators demand stringent adherence to **ICH Q-series** standards (Q8–Q12), lifecycle management protocols, and enhanced GMP expectations.
- India is improving its quality expectations but still faces challenges in universal implementation of updated GMPs and QbD approaches across manufacturing sites.

3. Inconsistencies in Bioequivalence (BE) Requirements

- EU BE guidelines require highly standardized study designs, including strict acceptance criteria, fed/fasting conditions, and requirements for highly-variable drugs.
- India's BE requirements, although improving, may permit more flexibility, occasionally resulting in divergent study expectations for the same generic product.

4. Delays in Review Timelines

- In India, approval timelines may be affected by limited reviewer capacity, backlog, and administrative delays.
- The EU maintains more predictable timelines, but mutual recognition and decentralized procedures can still experience delays due to country-specific queries from NCAs.

5. Limited Digital Infrastructure for eCTD

- The EU has fully implemented eCTD for most submissions, supported by advanced digital infrastructures.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 5 | May 2026 - Peer Reviewed Journal

- India is still expanding its eCTD acceptance, and many firms continue to depend on hybrid or partially digital submissions, leading to inconsistencies in dossier formats.

6. Complexity of Regional Labelling Requirements

- EU labelling requirements (including multi-language packs, QRD templates, and pharmacovigilance statements) are more complex compared with India.
- Differences in patient information leaflet (PIL) requirements add another layer of complexity.

7. Regulatory Uncertainty and Frequent Updates

- Frequent updates in EU guidelines (example: revisions to BE and nitrosamine risk assessment guidelines) require continuous industry monitoring.
- India is rapidly evolving, but updates may take longer to implement uniformly at the manufacturer and state licensing authority (SLA) level.

8. Pharmacovigilance and Post-Marketing Surveillance Gaps

- EU maintains structured pharmacovigilance systems (EudraVigilance, RMP requirements).
- India's PvPI is developing, but harmonization of adverse event reporting and signal detection remains challenging, affecting post-approval compliance.

9. Resource and Cost Burden

- Small and medium pharmaceutical enterprises (SMEs) in India may find EU dossiers cost-intensive due to high regulatory fees, stricter GMP compliance requirements, and extensive documentation needs.

CONCLUSION

This comparative review highlights that while both India and the European Union (EU) follow internationally recognized standards for generic drug dossier submissions—primarily through CTD and eCTD frameworks—their regulatory systems continue to show notable differences in structure, expectations, and operational efficiency. India's CDSCO, supported by the DCGI, has made significant progress toward harmonization with global norms, yet variations persist in dossier granularity, bioequivalence expectations, quality documentation, and facility inspection practices compared with the EMA and National Competent Authorities (NCAs). The EU maintains a more structured, highly standardized, and resource-intensive regulatory environment, with clearly defined centralized, decentralized, and mutual-recognition pathways, resulting in more predictable timelines but higher regulatory costs. In contrast, India offers comparatively flexible pathways and lower fees, though variability in review timelines and evolving digital submission practices continue to pose challenges.

Despite these differences, the growing convergence driven by ICH guidelines, increasing acceptance of eCTD formats, and continuous capacity-building efforts indicate a promising trajectory toward greater global regulatory alignment. Strengthening harmonization between India and the EU will not only reduce duplication of effort but also enhance generic drug availability, improve patient access, and support global pharmaceutical competitiveness. Ultimately, a coordinated effort toward streamlined review processes, clearer guidance, and enhanced regulatory collaboration will be essential for ensuring high-quality generic medicines reach markets efficiently and safely.

REFERENCES

1. *Mahajan AP, Basarkar GD. A comparative overview of generic drug regulation in US, Europe, Australia and India.* Int J Drug Reg Affairs. *2025;13(1):40-48.*
2. *Comparative analysis of generic drug assessment and regulatory approval in the USA, Europe and India.* Drug Approval Review. *2025.*
3. *Anantha Lakshmi D, Nagabhushanam MV, Ramakrishna G. Dossier preparation requirements for generic drugs of USA, Europe and India.* World J Pharm Res. *2023;12(9):112–130.*
4. *European Medicines Agency (EMA). Generic and hybrid medicines. EMA; 2024.*
5. *Critical and comparative analysis of ANDA filing of tablets in India, Europe and US.* PharmaTutor. *2023.*
6. *International Council for Harmonisation (ICH). The Common Technical Document (CTD) – Quality, Safety, Efficacy Guidelines. ICH; 2024.*
7. *Central Drugs Standard Control Organization (CDSCO). Guidance for Industry on Submission of Generic Drug Dossiers. Ministry of Health & Family Welfare, Government of India; 2023.*
8. *Directive 2001/83/EC of the European Parliament and of the Council on the Community code relating to medicinal products for human use. Official Journal of the European Communities; 2001.*
9. *European Medicines Agency (EMA). eCTD Submission Requirements in the EU. EMA; 2024.*
10. *Central Drugs Standard Control Organization (CDSCO). eCTD and Online Submission Portal Requirements. CDSCO; 2024.*